

### AMENDMENTS TO THE CLAIMS

1. (currently amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing etching bath for processing semiconductor wafers, said method comprising:

immersing processing wafers in a bath of semiconductor processing fluid contained within a processing apparatus; and

reducing a an overall volume of semiconductor processing fluid contained in said bath processing apparatus by rapidly displacing an upper portion of semiconductor processing fluid from said bath processing apparatus while said wafers are remain immersed in a lower portion of said semiconductor processing fluid in said bath processing apparatus to remove said surface contaminants from said air/liquid interface.

2-5. (previously canceled)

6. (previously amended) The method for removing contaminants from a processing bath for processing semiconductor wafers according to claim 1, wherein said contaminants include silica.

7. (currently amended) A method for reducing the contamination on a semiconductor wafer from a wet etching bath comprising:

processing said semiconductor wafer in said wet etching bath containing an etching fluid;

subsequently rapidly reducing a volume of said wet etching bath contained within a processing apparatus by removing a substantial portion of an upper portion of said etching fluid from said wet etching bath processing apparatus to reduce an overall volume of etching fluid in said processing apparatus and remove surface contaminants from an air/liquid interface of said wet etching bath while retaining said semiconductor wafer in a lower portion of said wet etching bath fluid controlled within said processing apparatus; and subsequently removing said semiconductor wafer from said wet etching bath.



8. (previously canceled)

9. (previously amended) The method for reducing the contamination on a semiconductor wafer from a wet etching bath according to claim 7, wherein said upper portion of said etching fluid is removed by draining a top portion of said etching fluid from said wet etching bath.

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cont. 10. (original) The method according to claim 9, wherein said upper portion of said etching fluid is removed by a paddle from the top of said wet etching bath.

11. (currently amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing etching bath for processing semiconductor wafers, said method comprising reducing a volume of said semiconductor processing bath contained within a processing apparatus by rapidly removing from said processing apparatus an upper portion of a semiconductor processing fluid present in said bath to rapidly reduce an overall volume of processing fluid contained within said processing apparatus, while said wafers are in said bath, by opening a valve in said bath to remove said surface contaminants from said air/liquid interface.

12. (currently amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing cleaning bath for processing semiconductor wafers, said method comprising reducing a volume of fluid in said semiconductor processing cleaning bath by rapidly removing from a processing apparatus an upper portion of a semiconductor processing fluid present in said bath while said wafers are in said bath, by hingedly releasing a door located at an upper portion of said bath to rapidly reduce an overall volume of processing fluid contained within said processing apparatus and to remove said surface contaminants from said air/liquid interface.

13. (original) The method according to claim 9, wherein said upper portion of said etching fluid is removed by sliding a door located at an upper portion of said wet etching bath.

14. (currently canceled)

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15. (currently amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing cleaning bath for processing semiconductor wafers, said method comprising reducing a volume of fluid in said semiconductor processing cleaning bath by rapidly removing an upper portion of a semiconductor processing fluid present in said bath from a processing apparatus, while said wafers are in said bath, by telescopically collapsing sidewalls of a vessel containing said bath to rapidly reduce an overall volume of processing fluid in said processing apparatus and to remove said surface contaminants from said air/liquid interface.

16. (previously canceled)

17. (currently amended) A method for etching a semiconductor wafer, said method comprising:

placing an aqueous hydrofluoric acid etching fluid into a wet etching vessel;  
immersing said semiconductor wafer in said etching fluid;  
contacting said semiconductor wafer with said etching fluid for a predetermined time;

reducing a volume of said etching fluid in which said wafers are immersed by rapidly removing a portion of said etching fluid from the upper surface of said etching fluid to reduce an overall volume of fluid contained in said wet etching vessel while keeping said semiconductor wafer immersed in a remaining portion of said etching fluid; and  
removing said semiconductor wafer from said etching fluid.

18. (original) The method according to claim 17, wherein said semiconductor wafer is a silicon wafer.

19. (previously canceled)

20. (original) The method according to claim 17, wherein said etching fluid is removed from an upper surface of said wet etching vessel by draining a top portion of said etching fluid from said wet etching vessel.

21. (currently amended) A method for etching a semiconductor wafer, said method comprising:

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placing an etching fluid into a wet etching vessel;  
placing said semiconductor wafer in said etching fluid;  
contacting said semiconductor wafer with said etching fluid for a predetermined time; and

reducing a volume of said etching fluid by rapidly removing a portion of said etching fluid from the upper surface of said wet etching vessel by opening a valve to reduce rapidly an overall volume of fluid in said wet etching vessel while said semiconductor wafer remains in a lower portion of said etching fluid.

22. (original) A method for etching a semiconductor wafer, said method comprising:

placing an etching fluid into a wet etching vessel;  
placing said semiconductor wafer in said etching fluid;  
contacting said semiconductor wafer with said etching fluid for a predetermined time; and

rapidly removing a portion of said etching fluid from the upper surface of said wet etching vessel by hingedly releasing a door located at an upper portion of said wet etching vessel.



Application No.: 09/123,430

Docket No.: M4065.0073/P073

23. (original) A method for etching a semiconductor wafer, said method comprising:

placing an etching fluid into a wet etching vessel;

placing said semiconductor wafer in said etching fluid;

contacting said semiconductor wafer with said etching fluid for a predetermined time; and

rapidly removing a portion of said etching fluid from the upper surface of said wet etching vessel by sliding a door located at an upper portion of said wet etching vessel.

24. (currently canceled)

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25. (currently amended) A method for etching a semiconductor wafer, said method comprising:

placing an aqueous hydrofluoric acid solution into a wet etching vessel;

placing said semiconductor wafer in said aqueous hydrofluoric acid solution;

contacting said semiconductor wafer with said aqueous hydrofluoric acid solution for a predetermined time; and

reducing a fluid-containing volume of said wet etching vessel so as to rapidly displace a portion of said aqueous hydrofluoric acid solution from ~~the~~ an upper surface portion of said wet etching vessel by telescopically collapsing sidewalls of said wet etching vessel.

26. (original) The method according to claim 17, wherein said etching fluid is removed from the upper surface of said wet etching vessel by physically removing a top portion of said etching fluid from said wet etching vessel.

27. (original) The method according to claim 26, wherein said top portion of said etching fluid is removed from said wet etching vessel by a paddle.

28-43. (previously canceled)



Application No.: 09/123,430

Docket No.: M4065.0073/P073

44. (currently amended) A method for reducing the contaminants on a silicon wafer during a wet etching process, said method comprising:

immersing a wafer boat suspended on a lifting arm in an etching vessel having an aqueous hydrofluoric acid solution therein for a sufficient time to etch said silicon wafer; and

rapidly removing said wafer boat from said etching vessel to remove surface contaminants residing on the upper surface of said aqueous hydrofluoric acid solution by an upward movement of said arm, thereby causing an upper portion of said aqueous hydrofluoric acid solution to spill out of said vessel to reduce the amount of said aqueous hydrofluoric acid solution in said etching vessel.

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45-51. (previously canceled)

52. (previously amended) A method for removing surface contaminants from a semiconductor processing bath for processing silicon wafers, said method comprising removing an upper portion of a semiconductor processing fluid present in said bath, while said wafers are in said bath, by sliding a door located at an upper portion of said bath.

53-57. (previously canceled)

58. (previously amended) A method for etching a semiconductor wafer, said method comprising:

placing an aqueous hydrofluoric acid solution into a wet etching vessel;  
placing said semiconductor wafer in said aqueous hydrofluoric acid solution;  
contacting said semiconductor wafer with said aqueous hydrofluoric acid solution for a predetermined time; and

removing a portion of said aqueous hydrofluoric acid solution from the upper surface of said wet etching vessel by sliding a door located at an upper portion of said wet etching vessel.



Application No.: 09/123,430

Docket No.: M4065.0073/P073

59-60. (previously canceled)

61. (currently amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing bath for processing semiconductor wafers, said method comprising:

reducing a volume of said semiconductor processing bath contained within a processing apparatus by rapidly removing an upper portion of a semiconductor processing fluid present in said ~~bath~~ processing apparatus, while said wafers are in a remaining lower portion of said bath, to permit flow of said upper portion of said processing fluid out of said processing apparatus, to reduce an overall volume of fluid contained within said processing apparatus and thereby break eddy currents holding said surface contaminants at said air/liquid interface.

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62. (original) The method for removing surface contaminants according to claim 61, wherein said upper portion of said semiconductor processing fluid is removed by a paddle from top of said bath.

63. (original) The method for removing surface contaminants according to claim 61, wherein said upper portion of said semiconductor processing fluid is removed by opening a valve in said bath.

64. (original) The method for removing surface contaminants according to claim 61, wherein said upper portion of said semiconductor processing fluid is removed by hingedly releasing a door located at an upper portion of said bath.

65. (previously amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing bath for processing semiconductor wafers, said method comprising:

rapidly removing an upper portion of a semiconductor processing fluid present in said bath by sliding a door located at an upper portion of said bath, while said wafers are in

said bath, to permit flow of said upper portion of said processing fluid and thereby break eddy currents holding said surface contaminants at said air/liquid interface.

66. (previously amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing bath for processing semiconductor wafers, said method comprising:

rapidly removing an upper portion of a semiconductor processing fluid present in said bath by rapidly removing a wafer boat containing said wafers from said bath, while said wafers are in said bath, to permit flow of said upper portion of said processing fluid and thereby break eddy currents holding said surface contaminants at said air/liquid interface.

67. (original) The method for removing surface contaminants according to claim 61, wherein said upper portion of said semiconductor processing fluid is removed by telescopically collapsing sidewalls of a vessel containing said bath.

68. (currently amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing bath for processing semiconductor wafers, said method comprising:

reducing a volume of said semiconductor processing bath in a processing vessel by rapidly removing an upper portion of a semiconductor processing fluid present in said ~~bath~~ processing vessel, while said wafers are in a remaining lower portion of said semiconductor processing fluid in said bath, to reduce an overall volume of fluid in said processing vessel and to permit flow of said upper portion of said processing fluid and thereby break surface tension forces holding said surface contaminants at said air/liquid interface.

69. (original) The method for removing surface contaminants according to claim 68, wherein said upper portion of said semiconductor processing fluid is removed by a paddle from top of said bath.





70. (original) The method for removing surface contaminants according to claim 68, wherein said upper portion of said semiconductor processing fluid is removed by opening a valve in said bath.

71. (original) The method for removing surface contaminants according to claim 68, wherein said upper portion of said semiconductor processing fluid is removed by hingedly releasing a door located at an upper portion of said bath.

72. (previously amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing bath for processing semiconductor wafers, said method comprising:

rapidly removing an upper portion of a semiconductor processing fluid present in said bath by sliding a door located at an upper portion of said bath, while said wafers are in said bath, to permit flow of said upper portion of said processing fluid and thereby break surface tension forces holding said surface contaminants at said air/liquid interface.

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73. (previously amended) A method for removing surface contaminants from an air/liquid interface of a semiconductor processing bath for processing semiconductor wafers, said method comprising:

rapidly removing an upper portion of a semiconductor processing fluid present in said bath by rapidly removing a wafer boat containing said wafers from said bath, while said wafers are in said bath, to permit flow of said upper portion of said processing fluid and thereby break surface tension forces holding said surface contaminants at said air/liquid interface.

74. (original) The method for removing surface contaminants according to claim 68, wherein said upper portion of said semiconductor processing fluid is removed by telescopically collapsing sidewalls of a vessel containing said bath.



75. (currently amended) A method for reducing the contamination on a semiconductor wafer from a wet etching bath comprising:

processing said semiconductor wafer in said wet etching bath containing an etching fluid;

subsequently reducing a volume of etching fluid in said wet etching bath and breaking eddy currents of said wet etching bath by rapidly removing an upper portion of said etching fluid from a processing vessel containing said wet etching bath to reduce an overall volume of fluid contained within said processing vessel, said act of breaking said eddy currents further releasing surface contaminants which are formed at an air/liquid interface of said wet etching bath and held at said air/liquid interface by said eddy currents; and

subsequently removing said semiconductor wafer from said wet etching bath.

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76. (currently amended) A method for reducing the contamination on a semiconductor wafer from a wet etching bath comprising:

processing said semiconductor wafer in said wet etching bath containing an etching fluid;

subsequently reducing a volume of said wet etching fluid and breaking surface tension forces of said wet etching bath by rapidly removing an upper portion of said etching fluid from a processing vessel containing said wet etching bath and reduce an overall volume of fluid contained within said processing vessel, said act of breaking said surface tension forces further releasing surface contaminants which are formed at an air/liquid interface of said wet etching bath and held at said air/liquid interface by said eddy currents; and

subsequently removing said semiconductor wafer from said wet etching bath.

77. (currently amended) A method for reducing the contamination on a semiconductor wafer, said method comprising:

processing said semiconductor wafer in a static etching bath containing an etching fluid; and

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reducing a volume of said etching fluid by rapidly removing an upper portion of said etching fluid from a container holding said static etching bath to reduce an overall volume of fluid contained within said container while said semiconductor wafer is in a remaining portion of said static etching bath.

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